

10/ 627, 743

> d hist

(FILE 'HOME' ENTERED AT 08:49:34 ON 13 JUL 2004)

FILE 'CA, CAPLUS, JAPIO' ENTERED AT 08:50:01 ON 13 JUL 2004

L1	408 S (CARBON MOLECULAR SIEVE)
L2	10 S L1 AND (MESOPORE OR MESOPOROUS)
L3	4 S L2 AND (MICROPORE OR MICROPOROUS)
L4	0 S L2 AND MICROPOROSITY
L5	0 S L1 AND (TOTAL VOLUME OF PORES)
L6	0 S L1 AND (PORE VOLUME DISTRIBUTION)
L7	1 S L1 AND (PORE VOLUME)
L8	17 S L1 AND (PORE SIZE DISTRIBUTION)
L9	2 S L8 AND (MESOPORE OR MESOPOROUS)

> s (carbon molecular sieve)
 L1 408 (CARBON MOLECULAR SIEVE)
 => s l1 and (mesopore or mesoporous)
 L2 10 L1 AND (MESOPORE OR MESOPOROUS)
 => s l2 and (micropore or microporous)
 L3 4 L2 AND (MICROPORE OR MICROPOROUS)
 => d l3 1-4 ti,ab,bib

L3 ANSWER 1 OF 4 CA COPYRIGHT 2004 ACS on STN
 TI Structural characterization of polyetherimide-based **carbon molecular sieve** membranes
 AB Supported carbon mol. sieve membranes (CMSMs) were prepd. by pyrolysis of a polyetherimide polymeric precursor. The membranes were characterized by SEM, energy dispersive spectroscopy, and **micropore** anal., using gas adsorption techniques to relate their microstructure characteristics to their transport and sepn. characteristics. The anal. shows that prepn. conditions det. whether the carbon mol. sieve layer forms within or outside the .gamma.-alumina layer of the substrate. **Micropore** CO2 and N2 adsorption anal. of both supported and unsupported CMSMs showed a sharp peak at about (3.6-3.8) .times. 10-10 m using the Horvath-Kawazoe method. For the supported CMSMs it was obsd. that consecutive coating/carbonization steps reduced the pore vol. in the micro- and **mesoporous** regions, without greatly affecting the vol. of pores in the range of (3.5-6) .times. 10-10 m. The redn. of the pore vol. in the micro- and **mesoporous** regions is accompanied by an increase in the sepn. factor and a decrease in the permeance after each coating/carbonization cycle. **Micropore** anal. of a membrane, whose performance had degraded, indicated that its vol. of pores between (3.6-6) .times. 10-10 m had drastically decreased from the corresponding value of the as-prepd. membranes.
 AN 133:337218 CA
 TI Structural characterization of polyetherimide-based **carbon molecular sieve** membranes
 AU Sedigh, Mehran G.; Jahangiri, Maryam; Liu, Paul K. T.; Sahimi, Muhammad; Tsotsis, Theodore T.
 CS Dept. of Chemical Engineering, University of Southern California, Los Angeles, CA, 90089, USA
 SO AIChE Journal (2000), 46(11), 2245-2255
 CODEN: AICEAC; ISSN: 0001-1541
 PB American Institute of Chemical Engineers
 DT Journal
 LA English
 RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 2 OF 4 CA COPYRIGHT 2004 ACS on STN
 TI Polyetherimide-based **carbon molecular sieve** membranes: transport investigations and morphological characterization
 AB Supported carbon mol. sieve membranes (CMSM)s were fabricated by dip-coating **mesoporous** alumina substrates in a poly(ether imide) soln. followed by carbonization of the material under inert gas atm. and controlled conditions. Transport studies show that the membranes provide for efficient sepn. of CO2 in mixts. with CH4, a desired process in upgrading landfill gas or biogas. The sepn. mechanism of these membranes was studied in terms of effects of operating conditions on permeance and CO2 sepn. factors in binary and ternary mixts. **Micropore** anal. using a gas adsorption technique with different probe gases (CO2, N2), was used to det. the pore size distribution and surface area of the membranes. SEM was used to study the morphol. and structure, and energy dispersive spectroscopy (EDS), Auger electron spectroscopy (AES) and elemental anal. were utilized to study the surface chem. Thermogravimetric anal. was

performed to study the carbonization process of the precursor polymer and the membrane stability during treatment in various environments.

AN 132:294707 CA

TI Polyetherimide-based **carbon molecular sieve**

membranes: transport investigations and morphological characterization

AU Sedigh, Mehran G.; Liu, Paul K. T.; Ciora, Richard J., Jr.; Tsotsis, Theodore T.; Sahimi, Muhammad

CS Department of Chemical Engineering, University of Southern California, Los Angeles, CA, 90089-1211, USA

SO Advances in Filtration and Separation Technology (1999), 13B(Advancing Filtration and Separation Solutions for the Millenium), 974-980
CODEN: ASTHEA

PB American Filtration & Separations Society

DT Journal

LA English

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 3 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN

TI Structural characterization of polyetherimide-based **carbon molecular sieve** membranes

AB Supported carbon mol. sieve membranes (CMSMs) were prepd. by pyrolysis of a polyetherimide polymeric precursor. The membranes were characterized by SEM, energy dispersive spectroscopy, and **micropore** anal., using gas adsorption techniques to relate their microstructure characteristics to their transport and sepn. characteristics. The anal. shows that prepn. conditions det. whether the carbon mol. sieve layer forms within or outside the .gamma.-alumina layer of the substrate. **Micropore** CO2 and N2 adsorption anal. of both supported and unsupported CMSMs showed a sharp peak at about (3.6-3.8) .times. 10-10 m using the Horvath-Kawazoe method. For the supported CMSMs it was obsd. that consecutive coating/carbonization steps reduced the pore vol. in the micro- and **mesoporous** regions, without greatly affecting the vol. of pores in the range of (3.5-6) .times. 10-10 m. The redn. of the pore vol. in the micro- and **mesoporous** regions is accompanied by an increase in the sepn. factor and a decrease in the permeance after each coating/carbonization cycle. **Micropore** anal. of a membrane, whose performance had degraded, indicated that its vol. of pores between (3.6-6) .times. 10-10 m had drastically decreased from the corresponding value of the as-prepd. membranes.

AN 2000:809511 CAPLUS

DN 133:337218

TI Structural characterization of polyetherimide-based **carbon molecular sieve** membranes

AU Sedigh, Mehran G.; Jahangiri, Maryam; Liu, Paul K. T.; Sahimi, Muhammad; Tsotsis, Theodore T.

CS Dept. of Chemical Engineering, University of Southern California, Los Angeles, CA, 90089, USA

SO AIChE Journal (2000), 46(11), 2245-2255
CODEN: AICEAC; ISSN: 0001-1541

PB American Institute of Chemical Engineers

DT Journal

LA English

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 4 OF 4 CAPLUS COPYRIGHT 2004 ACS on STN

TI Polyetherimide-based **carbon molecular sieve**

membranes: transport investigations and morphological characterization

AB Supported carbon mol. sieve membranes (CMSM)s were fabricated by dip-coating **mesoporous** alumina substrates in a poly(ether imide) soln. followed by carbonization of the material under inert gas atm. and controlled conditions. Transport studies show that the membranes provide for efficient sepn. of CO2 in mixts. with CH4, a desired process in

upgrading landfill gas or biogas. The sepn. mechanism of these membranes was studied in terms of effects of operating conditions on permeance and CO2 sepn. factors in binary and ternary mixts. **Micropore** anal. using a gas adsorption technique with different probe gases (CO2, N2), was used to det. the pore size distribution and surface area of the membranes. SEM was used to study the morphol. and structure, and energy dispersive spectroscopy (EDS), Auger electron spectroscopy (AES) and elemental anal. were utilized to study the surface chem. Thermogravimetric anal. was performed to study the carbonization process of the precursor polymer and the membrane stability during treatment in various environments.

AN 2000:14126 CAPLUS

DN 132:294707

TI Polyetherimide-based **carbon molecular sieve**

membranes: transport investigations and morphological characterization

AU Sedigh, Mehran G.; Liu, Paul K. T.; Ciora, Richard J., Jr.; Tsotsis, Theodore T.; Sahimi, Muhammad

CS Department of Chemical Engineering, University of Southern California, Los Angeles, CA, 90089-1211, USA

SO Advances in Filtration and Separation Technology (1999), 13B(Advancing Filtration and Separation Solutions for the Millenium), 974-980
CODEN: ASTHEA

PB American Filtration & Separations Society

DT Journal

LA English

RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d hist

(FILE 'HOME' ENTERED AT 08:49:34 ON 13 JUL 2004)

FILE 'CA, CAPLUS, JAPIO' ENTERED AT 08:50:01 ON 13 JUL 2004

L1 408 S (CARBON MOLECULAR SIEVE)

L2 10 S L1 AND (MESOPORE OR MESOPOROUS)

L3 4 S L2 AND (MICROPORE OR MICROPOROUS)

=> s l2 and microporosity

L4 0 L2 AND MICROPOROSITY

=> s l1 and (total volume of pores)

L5 0 L1 AND (TOTAL VOLUME OF PORES)

=> s l1 and (pore volume distribution)

L6 0 L1 AND (PORE VOLUME DISTRIBUTION)

=> s l1 and (pore volume)

L7 1 L1 AND (PORE VOLUME)

=> d l7 ti,ab,bib

L7 ANSWER 1 OF 1 JAPIO (C) 2004 JPO on STN

TI HIGHLY ACIDIC POROUS SOLID CATALYST HAVING SYNERGISTIC ACTION AND ITS APPLICATION

AB PROBLEM TO BE SOLVED: To provide a solid catalyst used in an acid catalyst organic reaction such as a Friedl-Crafts reaction, nitration, and cyclization by using a substance which comprises at least one of a sulfated metal oxide and a **carbon molecular sieve** and/or a heteropoly acid and has **pore volume** and a pore size distribution in respectively specified ranges.

SOLUTION: The active highly acidic microporous solid catalyst is obtained by making at least one of a sulfated metal oxide and a **carbon molecular sieve** and/or a heteropoly acid contained and

controlling the pore volume exist in the range of 0.1-0.2 m³/g and the pore size distribution exist in the range of 25-40 Å, Alternatively, the catalyst is prepared to contain at least one of a sulfated metal oxide and a carbon molecular sieve and/or a heteropoly acid and to have the BET surface area in the range of 60-165 m²/g, the pore volume in the range of 0.1-0.2 m³/g, the pore size distribution in the range of 25-40 Å, and spacing for all the peaks in the range of 1.5-3.75 Å.

COPYRIGHT: (C)1999,JPO

AN 1999-267524 JAPIO
TI HIGHLY ACIDIC POROUS SOLID CATALYST HAVING SYNERGISTIC ACTION AND ITS APPLICATION
IN YAHAV GANAPATI DADASAHEB; NAIR JAYESH JANARDHAN; NARENDRA VIKAS
PA SECRETARY DEPARTMENT OF SCI & TECHNOL GOVERNMENT OF INDIA
PI JP 11267524 A 19991005 Heisei
AI JP 1998-375451 (JP10375451 Heisei) 19981214
PRAI IN 1997-DE3591 19971212
IN 1997-DE3592 19971212
IN 1997-DE3593 19971212
SO PATENT ABSTRACTS OF JAPAN (CD-ROM), Unexamined Applications, Vol. 1999

=> s l1 and (pore size distribution)
L8 17 L1 AND (PORE SIZE DISTRIBUTION)

=> d hist

(FILE 'HOME' ENTERED AT 08:49:34 ON 13 JUL 2004)

FILE 'CA, CAPLUS, JAPIO' ENTERED AT 08:50:01 ON 13 JUL 2004

L1 408 S (CARBON MOLECULAR SIEVE)
L2 10 S L1 AND (MESOPORE OR MESOPOROUS)
L3 4 S L2 AND (MICROPORE OR MICROPOROUS)
L4 0 S L2 AND MICROPOROSITY
L5 0 S L1 AND (TOTAL VOLUME OF PORES)
L6 0 S L1 AND (PORE VOLUME DISTRIBUTION)
L7 1 S L1 AND (PORE VOLUME)
L8 17 S L1 AND (PORE SIZE DISTRIBUTION)

=> s l8 and (mesopore or mesoporous)
L9 2 L8 AND (MESOPORE OR MESOPOROUS)

=> d l9 1-2 ti,ab,bib

L9 ANSWER 1 OF 2 CA COPYRIGHT 2004 ACS on STN
TI Polyetherimide-based carbon molecular sieve
membranes: transport investigations and morphological characterization
AB Supported carbon mol. sieve membranes (CMSM)s were fabricated by dip-coating mesoporous alumina substrates in a poly(ether imide) soln. followed by carbonization of the material under inert gas atm. and controlled conditions. Transport studies show that the membranes provide for efficient sepn. of CO₂ in mixts. with CH₄, a desired process in upgrading landfill gas or biogas. The sepn. mechanism of these membranes was studied in terms of effects of operating conditions on permeance and CO₂ sepn. factors in binary and ternary mixts. Micropore anal. using a gas adsorption technique with different probe gases (CO₂, N₂), was used to det. the pore size distribution and surface area of the membranes. SEM was used to study the morphol. and structure, and energy dispersive spectroscopy (EDS), Auger electron spectroscopy (AES) and elemental anal. were utilized to study the surface chem. Thermogravimetric anal. was performed to study the carbonization process of the precursor polymer and the membrane stability during treatment in various environments.

AN 132:294707 CA
 TI Polyetherimide-based **carbon molecular sieve**
 membranes: transport investigations and morphological characterization
 AU Sedigh, Mehran G.; Liu, Paul K. T.; Ciora, Richard J., Jr.; Tsotsis,
 Theodore T.; Sahimi, Muhammad
 CS Department of Chemical Engineering, University of Southern California, Los
 Angeles, CA, 90089-1211, USA
 SO Advances in Filtration and Separation Technology (1999), 13B(Advancing
 Filtration and Separation Solutions for the Millenium), 974-980
 CODEN: ASTHEA
 PB American Filtration & Separations Society
 DT Journal
 LA English
 RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L9 ANSWER 2 OF 2 CAPLUS COPYRIGHT 2004 ACS on STN
 TI Polyetherimide-based **carbon molecular sieve**
 membranes: transport investigations and morphological characterization
 AB Supported carbon mol. sieve membranes (CMSM)s were fabricated by
 dip-coating **mesoporous** alumina substrates in a poly(ether imide)
 soln. followed by carbonization of the material under inert gas atm. and
 controlled conditions. Transport studies show that the membranes provide
 for efficient sepn. of CO2 in mixts. with CH4, a desired process in
 upgrading landfill gas or biogas. The sepn. mechanism of these membranes
 was studied in terms of effects of operating conditions on permeance and
 CO2 sepn. factors in binary and ternary mixts. Micropore anal. using a
 gas adsorption technique with different probe gases (CO2, N2), was used to
 det. the **pore size distribution** and surface
 area of the membranes. SEM was used to study the morphol. and structure,
 and energy dispersive spectroscopy (EDS), Auger electron spectroscopy
 (AES) and elemental anal. were utilized to study the surface chem.
 Thermogravimetric anal. was performed to study the carbonization process
 of the precursor polymer and the membrane stability during treatment in
 various environments.

AN 2000:14126 CAPLUS
 DN 132:294707
 TI Polyetherimide-based **carbon molecular sieve**
 membranes: transport investigations and morphological characterization
 AU Sedigh, Mehran G.; Liu, Paul K. T.; Ciora, Richard J., Jr.; Tsotsis,
 Theodore T.; Sahimi, Muhammad
 CS Department of Chemical Engineering, University of Southern California, Los
 Angeles, CA, 90089-1211, USA
 SO Advances in Filtration and Separation Technology (1999), 13B(Advancing
 Filtration and Separation Solutions for the Millenium), 974-980
 CODEN: ASTHEA
 PB American Filtration & Separations Society
 DT Journal
 LA English
 RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> d hist

(FILE 'HOME' ENTERED AT 08:49:34 ON 13 JUL 2004)

FILE 'CA, CAPLUS, JAPIO' ENTERED AT 08:50:01 ON 13 JUL 2004

L1 408 S (CARBON MOLECULAR SIEVE)
 L2 10 S L1 AND (MESOPORE OR MESOPOROUS)
 L3 4 S L2 AND (MICROPORE OR MICROPOROUS)
 L4 0 S L2 AND MICROPOROSITY
 L5 0 S L1 AND (TOTAL VOLUME OF PORES)
 L6 0 S L1 AND (PORE VOLUME DISTRIBUTION)

L7 1 S L1 AND (PORE VOLUME)
L8 17 S L1 AND (PORE SIZE DISTRIBUTION)
L9 2 S L8 AND (MESOPORE OR MESOPOROUS)

=> d l8 1-17 ti,ab

- L8 ANSWER 1 OF 17 CA COPYRIGHT 2004 ACS on STN
TI The structural characterization of **carbon molecular sieve** membrane (CMSM) via gas adsorption
AB The microstructure of a carbon mol. sieve membrane (CMSM) is characterized using adsorption equil. information. The pore size distributions of the CMSM derived from N2 and CH4 adsorption isotherm are found to be consistent with each other and in agreement with the results of gas permeation expts. as well as the general characteristics of such mol. sieve materials.
- L8 ANSWER 2 OF 17 CA COPYRIGHT 2004 ACS on STN
TI Extension of the Dubinin-Astakhov equation for evaluating the micropore size distribution of a modified **carbon molecular sieve**
AB A new method for the characterization of the **pore size distribution** of microporous solids was applied on data obtained for activated carbon mol. sieve samples. In this method, based on the Dubinin-Astakhov equation, a simple numerical algorithm is used for the reconstruction of the micropore size distribution from the integral equation that represents the exptl. nitrogen adsorption isotherm. The results are compared with the ones obtained on the basis of the well-known Horvath-Kawazoe method. The samples used in this study come from a carbon mol. sieve that was treated with solns. of concd. HNO3 at various temps. and with solns. of H2O2 of various concns.
- L8 ANSWER 3 OF 17 CA COPYRIGHT 2004 ACS on STN
TI Preparation of **carbon molecular sieve** from a new natural source
AB A local Persian nutshell was used as the raw material to prep. a particular C mol. sieve (CMS) to sep. CH4 from N2 and also N2 from O2. The C samples were added to known amt. of coal tar pitch dissolved in boiling benzene and treated with ZnCl2 aq. solns. for influencing the level of impregnation. The final samples prepd. were analyzed by various techniques such as mol. probe and BET methods. The results show that a CMS with high adsorption selectivity and a **pore size distribution** could be prepd. with an av. pore size diam. of smaller than 4 .ANG..
- L8 ANSWER 4 OF 17 CA COPYRIGHT 2004 ACS on STN
TI Characterization of **Carbon Molecular Sieve**
3A
AB Comprehensive characterization of a C mol. sieve (CMS) pellet is undertaken using Hg intrusion, gas permeation, adsorption kinetics, and equil. measurements. Gas permeation and Hg intrusion are employed to characterize the macropore structure of the CMS while adsorption equil. and kinetics are exploited for characterization of micropores. The relation between adsorbed phase mobility and gas-phase concn. obtained by measurement of the kinetics of adsorption follows the Darken relation. The trend in magnitude of the mobility parameter follows that of other CMS samples (O2 > CO2 > N2 > Ar), and some deviation from Fickian behavior is obsd. in the uptake of larger mols., presumably because of interference from a pore mouth barrier.
- L8 ANSWER 5 OF 17 CA COPYRIGHT 2004 ACS on STN
TI Polyetherimide-based **carbon molecular sieve** membranes: transport investigations and morphological characterization
AB Supported carbon mol. sieve membranes (CMSM)s were fabricated by dip-coating mesoporous alumina substrates in a poly(ether imide) soln.

followed by carbonization of the material under inert gas atm. and controlled conditions. Transport studies show that the membranes provide for efficient sepn. of CO₂ in mixts. with CH₄, a desired process in upgrading landfill gas or biogas. The sepn. mechanism of these membranes was studied in terms of effects of operating conditions on permeance and CO₂ sepn. factors in binary and ternary mixts. Micropore anal. using a gas adsorption technique with different probe gases (CO₂, N₂), was used to det. the **pore size distribution** and surface area of the membranes. SEM was used to study the morphol. and structure, and energy dispersive spectroscopy (EDS), Auger electron spectroscopy (AES) and elemental anal. were utilized to study the surface chem. Thermogravimetric anal. was performed to study the carbonization process of the precursor polymer and the membrane stability during treatment in various environments.

L8 ANSWER 6 OF 17 CA COPYRIGHT 2004 ACS on STN

TI Statistical Mechanics and Molecular Simulation of Adsorption in Microporous Materials: Pillared Clays and **Carbon Molecular Sieve** Membranes

AB The authors report the results of extensive equil. mol. dynamics simulation of adsorption of single-component and binary gas mixts. in models of 2 classes of microporous materials, namely, pillared clays and C mol. sieve membranes (CMSMs), both of which have been used for sepn. of gas mixts. The authors develop a novel 3-dimensional mol. pore network model for CMSMs based on Voronoi tessellation. The simulations allow one to study the effect of the morphol. of the pore space, i.e., its **pore size distribution** and pore connectivity on the adsorption isotherms. The simulation results are also used to test the accuracy of a recently developed statistical mech. theory of adsorption. The theory provides very accurate predictions for the simulation results for both classes of the microporous materials over a wide range of the porosity of the porous materials.

L8 ANSWER 7 OF 17 CA COPYRIGHT 2004 ACS on STN

TI Molecular probe technique for the assessment of the **carbon molecular sieve** structure

AB N adsorption at 77 K is the most common technique for defining the surface area and pore vol. of a porous material. However, it is not adequate to assess the microporosity of C mol. sieves (CMS), because of activated diffusion effects. A mol. probe technique was used to define the pore size of CMS materials. Adsorption of gases (vapors) with different mol. sizes was measured by a gravimetric method using a spring balance. The amt. adsorbed at room temp. was recorded over a 24-h period. The following mol. probes were chosen: CO₂ (0.33 nm), C₂H₆ (0.4 nm), n-C₄H₁₀ (0.43 nm), i-C₅H₁₂ (0.5 nm), and CCl₄ (0.6 nm). The micropore vols. were estd. by the Dubinin-Radushkevich (DR) equation. Assuming that the diams. of the micropores are larger than those of the adsorbed mols., the micropore vol. distribution of each sample was estd. The main pore sizes of the studied CMSs are <0.5 nm. One of the samples had a narrow **pore size distribution** of 0.33-0.43 nm, which is the crit. pore size for kinetic sepn. of O from N. The mol. probe technique is an effective means to assess the CMS adsorbent structure, which is not currently possible using conventional approaches with a single adsorbate, such as N or Ar.

L8 ANSWER 8 OF 17 CA COPYRIGHT 2004 ACS on STN

TI Modeling of a pressure-swing adsorption process for oxygen enrichment with **carbon molecular sieve**

AB Adsorptive sepn. of O from N and Ar is carried out in the desorption steps of a pressure-swing-adsorption (PSA) process which uses C mol. sieves CMSN2. The adsorption isotherms of the 3 main components of air are very similar. Because of the **pore size distribution** of CMSN2, the diffusion coeff. of O is >8 times those of N and Ar, so that air sepn. occurs by adsorption kinetics. Exptl.

results for the individual steps and cyclic operation of the PSA process are presented and compared with the predictions of an isothermal plug-flow model. The adsorption rate is represented by a linear driving-force equation. If the diffusion coeffs. are adapted sep. to every step, a good agreement is obsd. between the model calcns. and exptl. results.

L8 ANSWER 9 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI The structural characterization of **carbon molecular sieve** membrane (CMSM) via gas adsorption

AB The microstructure of a carbon mol. sieve membrane (CMSM) is characterized using adsorption equil. information. The pore size distributions of the CMSM derived from N₂ and CH₄ adsorption isotherm are found to be consistent with each other and in agreement with the results of gas permeation expts. as well as the general characteristics of such mol. sieve materials.

L8 ANSWER 10 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Extension of the Dubinin-Astakhov equation for evaluating the micropore size distribution of a modified **carbon molecular sieve**

AB A new method for the characterization of the **pore size distribution** of microporous solids was applied on data obtained for activated carbon mol. sieve samples. In this method, based on the Dubinin-Astakhov equation, a simple numerical algorithm is used for the reconstruction of the micropore size distribution from the integral equation that represents the exptl. nitrogen adsorption isotherm. The results are compared with the ones obtained on the basis of the well-known Horvath-Kawazoe method. The samples used in this study come from a carbon mol. sieve that was treated with solns. of concd. HNO₃ at various temps. and with solns. of H₂O₂ of various concns.

L8 ANSWER 11 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Preparation of **carbon molecular sieve** from a new natural source

AB A local Persian nutshell was used as the raw material to prep. a particular C mol. sieve (CMS) to sep. CH₄ from N₂ and also N₂ from O₂. The C samples were added to known amt. of coal tar pitch dissolved in boiling benzene and treated with ZnCl₂ aq. solns. for influencing the level of impregnation. The final samples prepd. were analyzed by various techniques such as mol. probe and BET methods. The results show that a CMS with high adsorption selectivity and a **pore size distribution** could be prepd. with an av. pore size diam. of smaller than 4 .ANG..

L8 ANSWER 12 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Characterization of **Carbon Molecular Sieve** 3A

AB Comprehensive characterization of a C mol. sieve (CMS) pellet is undertaken using Hg intrusion, gas permeation, adsorption kinetics, and equil. measurements. Gas permeation and Hg intrusion are employed to characterize the macropore structure of the CMS while adsorption equil. and kinetics are exploited for characterization of micropores. The relation between adsorbed phase mobility and gas-phase concn. obtained by measurement of the kinetics of adsorption follows the Darken relation. The trend in magnitude of the mobility parameter follows that of other CMS samples (O₂ > CO₂ > N₂ > Ar), and some deviation from Fickian behavior is obsd. in the uptake of larger mols., presumably because of interference from a pore mouth barrier.

L8 ANSWER 13 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Statistical Mechanics and Molecular Simulation of Adsorption in Microporous Materials: Pillared Clays and **Carbon Molecular Sieve** Membranes

AB The authors report the results of extensive equil. mol. dynamics

simulation of adsorption of single-component and binary gas mixts. in models of 2 classes of microporous materials, namely, pillared clays and C mol. sieve membranes (CMSMs), both of which have been used for sepn. of gas mixts. The authors develop a novel 3-dimensional mol. pore network model for CMSMs based on Voronoi tessellation. The simulations allow one to study the effect of the morphol. of the pore space, i.e., its **pore size distribution** and pore connectivity on the adsorption isotherms. The simulation results are also used to test the accuracy of a recently developed statistical mech. theory of adsorption. The theory provides very accurate predictions for the simulation results for both classes of the microporous materials over a wide range of the porosity of the porous materials.

L8 ANSWER 14 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Polyetherimide-based **carbon molecular sieve**

AB membranes: transport investigations and morphological characterization Supported carbon mol. sieve membranes (CMSM)s were fabricated by dip-coating mesoporous alumina substrates in a poly(ether imide) soln. followed by carbonization of the material under inert gas atm. and controlled conditions. Transport studies show that the membranes provide for efficient sepn. of CO₂ in mixts. with CH₄, a desired process in upgrading landfill gas or biogas. The sepn. mechanism of these membranes was studied in terms of effects of operating conditions on permeance and CO₂ sepn. factors in binary and ternary mixts. Micropore anal. using a gas adsorption technique with different probe gases (CO₂, N₂), was used to det. the **pore size distribution** and surface area of the membranes. SEM was used to study the morphol. and structure, and energy dispersive spectroscopy (EDS), Auger electron spectroscopy (AES) and elemental anal. were utilized to study the surface chem. Thermogravimetric anal. was performed to study the carbonization process of the precursor polymer and the membrane stability during treatment in various environments.

L8 ANSWER 15 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Molecular probe technique for the assessment of the **carbon molecular sieve** structure

AB N adsorption at 77 K is the most common technique for defining the surface area and pore vol. of a porous material. However, it is not adequate to assess the microporosity of C mol. sieves (CMS), because of activated diffusion effects. A mol. probe technique was used to define the pore size of CMS materials. Adsorption of gases (vapors) with different mol. sizes was measured by a gravimetric method using a spring balance. The amt. adsorbed at room temp. was recorded over a 24-h period. The following mol. probes were chosen: CO₂ (0.33 nm), C₂H₆ (0.4 nm), n-C₄H₁₀ (0.43 nm), i-C₅H₁₂ (0.5 nm), and CCl₄ (0.6 nm). The micropore vols. were estd. by the Dubinin-Radushkevich (DR) equation. Assuming that the diams. of the micropores are larger than those of the adsorbed mols., the micropore vol. distribution of each sample was estd. The main pore sizes of the studied CMSs are <0.5 nm. One of the samples had a narrow **pore size distribution** of 0.33-0.43 nm, which is the crit. pore size for kinetic sepn. of O from N. The mol. probe technique is an effective means to assess the CMS adsorbent structure, which is not currently possible using conventional approaches with a single adsorbate, such as N or Ar.

L8 ANSWER 16 OF 17 CAPLUS COPYRIGHT 2004 ACS on STN

TI Modeling of a pressure-swing adsorption process for oxygen enrichment with **carbon molecular sieve**

AB Adsorptive sepn. of O from N and Ar is carried out in the desorption steps of a pressure-swing-adsorption (PSA) process which uses C mol. sieves CMSN2. The adsorption isotherms of the 3 main components of air are very similar. Because of the **pore size distribution** of CMSN2, the diffusion coeff. of O is >8 times those of N and Ar, so that air sepn. occurs by adsorption kinetics. Exptl.

results for the individual steps and cyclic operation of the PSA process are presented and compared with the predictions of an isothermal plug-flow model. The adsorption rate is represented by a linear driving-force equation. If the diffusion coeffs. are adapted sep. to every step, a good agreement is obsd. between the model calcns. and exptl. results.

L8 ANSWER 17 OF 17 JAPIO (C) 2004 JPO on STN

TI HIGHLY ACIDIC POROUS SOLID CATALYST HAVING SYNERGISTIC ACTION AND ITS APPLICATION

AB PROBLEM TO BE SOLVED: To provide a solid catalyst used in an acid catalyst organic reaction such as a Friedl-Crafts reaction, nitration, and cyclization by using a substance which comprises at least one of a sulfated metal oxide and a **carbon molecular sieve** and/or a heteropoly acid and has pore volume and a **pore size distribution** in respectively specified ranges.

SOLUTION: The active highly acidic microporous solid catalyst is obtained by making at least one of a sulfated metal oxide and a **carbon molecular sieve** and/or a heteropoly acid contained and controlling the pore volume exist in the range of 0.1-0.2 m³/g and the **pore size distribution** exist in the range of 25-40 Å; Alternatively, the catalyst is prepared to contain at least one of a sulfated metal oxide and a **carbon molecular sieve** and/or a heteropoly acid and to have the BET surface area in the range of 60-165 m²/g, the pore volume in the range of 0.1-0.2 m³/g, the **pore size distribution** in the range of 25-40 Å; and spacing for all the peaks in the range of 1.5-3.75 Å;.

COPYRIGHT: (C)1999,JPO

L Number	Hits	Search Text	DB	Time stamp
9	233	(molecular adj sieve) same (mesopor\$3 and micropor\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:37
10	0	(((molecular adj sieve) same (mesopor\$3 and micropor\$3)) and (mesorod and microrod))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:33
11	24	(((molecular adj sieve) same (mesopor\$3 and micropor\$3)) and rod)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:33
12	16	(((molecular adj sieve) same (mesopor\$3 and micropor\$3)) and rod) and (microporosity or porosity)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:34
13	12	(((((molecular adj sieve) same (mesopor\$3 and micropor\$3)) and rod) and (microporosity or porosity)) and (volume near5 pore))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:34
14	1432	carbon adj (molecular adj sieve)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:38
15	0	(carbon adj (molecular adj sieve)) same (mesopor\$3 and micropor\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:38
16	42	(carbon adj (molecular adj sieve)) same (volume near5 pore)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:39
17	10	((carbon adj (molecular adj sieve)) same (volume near5 pore)) and mesopor\$3	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:39
18	10	((((carbon adj (molecular adj sieve)) same (volume near5 pore)) and mesopor\$3) and micropor\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:39
19	10	(((((carbon adj (molecular adj sieve)) same (volume near5 pore)) and mesopor\$3) and micropor\$3) and (volume near5 pore))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:39
-	44339	molecular adj sieve	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/13 08:32
-	391	(molecular adj sieve) and (precursor near5 carbon)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:36
-	6	(template same (mcm or kit or msu or sba)) and ((molecular adj sieve) and (precursor near5 carbon))	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 09:16
-	8	((molecular adj sieve) and (precursor near5 carbon)) and (monosaccharide or oligosaccharide)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 09:24

-	2	(molecular adj sieve) and (silica adj oligomer)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:38
-	0	((molecular adj sieve) and (silica adj oligomer)) and (precursor near5 carbon)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:38
-	32	(molecular adj sieve) and (silica near5 oligomer)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:38
-	0	((molecular adj sieve) and (silica near5 oligomer)) and (precursor near5 carbon)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:39
-	454	(molecular adj sieve) and (TEOS or tetraalkylorthosilicate)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:38
-	19	((molecular adj sieve) and (TEOS or tetraalkylorthosilicate)) and (precursor near5 carbon)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:39
-	3	("4329260").PN.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:45
-	4	("4425316").PN.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/07 10:50
-	3463	carbon near5 (molecular adj sieve)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:12
-	120	(carbon near5 (molecular adj sieve)) and (mesopor\$3 and micropor\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:13
-	52	((carbon near5 (molecular adj sieve)) and (mesopor\$3 and micropor\$3)) and (pore near5 volume)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:13
-	17	((((carbon near5 (molecular adj sieve)) and (mesopor\$3 and micropor\$3)) and (pore near5 volume)) and microporosity	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 08:47
-	1432	carbon adj (molecular adj sieve)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:12
-	186	(carbon adj (molecular adj sieve)) and (pore near5 volume)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:13
-	39	((carbon adj (molecular adj sieve)) and (pore near5 volume)) and (mesopor\$3 and micropor\$3)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:13
-	26	((((carbon adj (molecular adj sieve)) and (pore near5 volume)) and (mesopor\$3 and micropor\$3)) and porosity	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:16

-	17	((carbon adj (molecular adj sieve)) and (pore near5 volume)) and (mesopor\$3 and micropor\$3)) and microporosity	USPAT; US-PGPUB; EPO; JPO; DERWENT	2004/07/08 09:16
---	----	--	---	------------------